MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2022 / 2023 (TERM ID: 2220)

PCO 0165 – INTRODUCTION TO COMPUTER ARCHITECTURE AND OPERATING SYSTEM

(Foundation in Information Technology)

11 JULY 2023
9 a.m – 11 a.m
(2 Hours)

INSTRUCTIONS TO STUDENT

1. This question paper consists of 3 pages (excluding the cover page) with 5 questions only.

2. Attempt **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.

3. Please write all your answers in the Answer Booklet provided.

QUESTION 1 [10 Marks]

a. Briefly discuss why IBM System 370 machine is the best example to use when explaining the meaning of computer architecture?

(3 marks)

b. The evolution of the computer is divided into five subsequent phases called the computer generations which are from first generation to fifth generation. State and briefly explain any **THREE (3)** significance features of third generation computers.

(3 marks)

c. Briefly describe what is the concept of "Von Neumann architecture".

(2 marks)

d. From your observation of developments in microprocessor technology from the first general-purpose microprocessor which was around 1970s to the latest microprocessor technology, state any **FOUR (4)** features that are enhanced from time to time to give better impact to the performance of a computer system.

(2 marks)

QUESTION 2 [10 Marks]

a. Do the following conversions and show the steps clearly.
   i. Convert the decimal number 41.6875 to binary.
   ii. Convert the binary number 1110101 to decimal.
   iii. Convert the decimal number 7562 to octal.
   iv. Convert the hexadecimal number 7C to binary.

(4 marks)

b. Show the steps and the result of the following binary arithmetic operations.
   i. 0010 1101 + 0011 1110
   ii. 1100 0000 – 0011 0101

(2 marks)

c. Show the steps to convert a decimal number -120 to 8-bit signed binary in two's complement representation.

(2 marks)

d. Show the steps to convert a decimal number 120.25 to 32-bit binary floating-point standard.

(2 marks)

Continued...

QUESTION 3 [10 Marks]

a. Explain in sentences what each the following instruction accomplishes when it is executed.
   i. LDAX B
   ii. DCR B
   iii. SHLD 4005H
   iv. ADD M

(2 marks)

b. Name the addressing mode of the following instructions.
   i. STAX D
   ii. MVI B, BDH
   iii. STA 5000H
   iv. MOV B, A

(2 marks)

c. Write an assembly language program to add numbers 30H, 6CH and BBH, and the result is to be stored in memory location 6000H.

(2 marks)

d. What will be the contents of accumulator and flag registers, after the execution of the following instructions?

```
MVI A, 0CH
MVI B, 05H
ADD B
HLT
```

Accumulator –
S –
Z –
AC –
P –
CY –

(3 marks)

e. Write one-line assembly language instruction to do the following operations.
   i. To load data from memory location 2050H to register A.
   ii. To subtract data of register C from Accumulator.

(1 mark)

Continued...

QUESTION 4 [10 Marks]

a. State any **FOUR (4)** basic tasks of an operating system in a computer.

(2 marks)

b. One of the highlights introduced during third generation computers was spooling in operating system. What is spooling? How can it help to increase the performance of a computer system?

(2 marks)

c. Briefly discuss the difference between multiprocessing operating systems and multitasking operating systems.

(2 marks)

d. An operating system has to manage the "storage" in the computer. What are the **TWO (2)** types of "storage" and state the **THREE** (3) activities involved during storage management.

(4 marks)

QUESTION 5 [10 Marks]

a. In Windows operating system, File Explorer is a program to do file management. State any **FOUR (4)** tasks that you can perform using this program.

(2 marks)

b. Contiguous, linked and indexed are three types of file allocation method. Which method is the best among the three methods? Briefly explain.

(2 marks)

c. Protection in the file system can be accomplished by controlling the type of access to the file. For an example, if the access type of the file is to list only, the user can see the file name and its attributes only. State any other **FOUR (4)** types of access on files that can be controlled in file access mechanism.

(2 marks)

d. Utility programs help our computers run more effectively. Briefly explain how the following programs help to do that.
   i. Compression program
   ii. Defragmentation program
   iii. Backup program
   iv. Antivirus program

(4 marks)

End of Paper